EMC²

RELEASE NOTES

EMC AX150-Series Integrated Management Software

Version 02.20.150.5.024

Release Notes

P/N 300-003-021
REV A06
April 13, 2007

These release notes contain supplemental information about EMC® CLARiiON® AX150SC, AX150SCi, AX150, and AX150i Integrated Management Software version 02.20.150.5.024.

This document uses the following terms:

- *Server* refers to a server or host that sends data to or receives data from the storage system.
- *Management station* refers to a server or host on the same LAN as the storage system.

You will start Navisphere® Express in a browser running on a management station. A management station can also be a server.

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Product description

The AX150SC, AX150SCi, AX150, and AX150i Integrated Management Software consist of the storage-system and server software below.

Storage-system software component	Version
FLARE® Operating Environment, which includes - Shared storage control - Navisphere® Express - Snapshot management	02.20.150.5.024
Server software component	**Version**
Navisphere Storage System Initialization Utility for Red Hat or SUSE Linux	6.20.0.3.11
Navisphere Storage System Initialization Utility for Novell NetWare	6.20.0.3. 11
Navisphere Storage System Initialization Utility for Microsoft Windows	6.20.0.3. 11
Navisphere Storage System Initialization Utility for Sun Solaris	6.20.0.3. 11
Navisphere Server Utility for Red Hat or SUSE Linux	6.20.0.3. 12
Navisphere Server Utility for Novell NetWare	6.20.0.3. 11
Navisphere Server Utility for Microsoft Windows	6.20.2.0.0
Navisphere Server Utility for Sun Solaris	6.20.0.3. 11
VSS Provider	1.5.0.3.5
PowerPath® for Microsoft Windows	See the PowerPath release notes on the AX150 support website*
PowerPath for Red Hat or SUSE Linux	
PowerPath for Novell NetWare**	
PowerPath for Sun Solaris**	

* For information on accessing the AX150 support website, refer to the support information that shipped with your storage system.

** AX150SCi and AX150i storage systems do not support Novell Netware and Sun Solaris operating systems.

Please go to your AX150 support website to download the latest version of the software, and to download a localized version of Navisphere Express. Navisphere Express is available in Chinese, English, French, German, Italian, Japanese, Korean and Portuguese.

FLARE Operating Environment software

FLARE Operating Environment (OE) software controls the operation of the AX150SC, AX150SCi, AX150, and AX150i disk-array storage systems.

AX150SC and AX150SCi storage systems ship with a complete copy of FLARE OE software installed on the first and third disk modules (disk modules 0 and 2). These disk modules store mirrored copies of the software for the AX150SC and AX150SCi storage processor (SP).

AX150 and AX150i storage systems ship with a complete copy of FLARE OE software installed on the first four disk modules (disk modules 0 through 3). Disk modules 0 and 2 store mirrored copies of the software for SP A, and disks 1 and 3 store mirrored copies of the software for SP B.

When you power up the storage system, each SP boots and executes FLARE OE software.

Shared storage control

Shared storage control software allows only the server(s) assigned to a virtual disk to access the virtual disk.

Navisphere Express

EMC Navisphere Express is a storage-system-based management utility for configuring and managing AX150-series storage systems. This product provides the following functionality:

- Storage configuration and allocation
- Event management

Each AX150SC, AX150SCi, AX150, and AX150i storage system ships from the factory with Navisphere Express installed.

Snapshot management software

The snapshot management software is a storage-system-based software application that lets you create a point-in-time copy — a snapshot — of a virtual disk; that is, you determine when the snapshot starts. A secondary server can then access and use the snapshot for backup purposes or as a base for temporary operations on the copy of the production data without changing the source data on the virtual disk.

Before you can start a snapshot, you must allocate the required snapshot disk resources. When the allocation completes, the state of the snapshot transitions to Ready, which means you can start the snapshot on the source server and then access the snapshot on the secondary server.

When you no longer require the snapshot's data, you can remove access to the snapshot. Only after you do this can you stop the snapshot. When you stop a snapshot, the point-in-time copy ends and the snapshot disk resources are freed for other snapshots to use. If you do not want to start another snapshot for this source virtual disk, you can destroy the snapshot. Destroying the snapshot frees and deallocates the snapshot disk resources that were allocated when you prepared the snapshot.

Each AX150SC, AX150SCi, AX150, and AX150i storage system ships from the factory with snapshot management software installed.

Navisphere Storage System Initialization Utility

The EMC Navisphere Storage System Initialization Utility runs on your management station or attached server. It discovers uninitialized AX150-series storage systems, lets you assign IP addresses to the SPs on the same subnet, and set up security for these storage systems.

The Navisphere Storage System Initialization Utility ships on the *AX-Series Server Support* CD that is supplied with the storage system.

Navisphere Server Utility

The EMC Navisphere Server Utility runs on each server connected to your AX150-series storage system. This utility lets you register the server with your AX150-series storage system. It also allows you to use snapshots on your servers. It lets you start, stop, access or remove a snapshot.

The Navisphere Server Utility ships on the *AX-Series Server Support* CD that is supplied with the storage system.

PowerPath software

PowerPath path management software manages the paths between a Windows, Linux, NetWare, or Solaris server and virtual disks in the storage system. It transfers I/O to a working path if one path fails and provides load balancing to distribute I/O load equally among paths.

The PowerPath software ships on the PowerPath CDs that are supplied with the storage system. Always check the support website for the latest version of PowerPath.

CLARiiON VSS Provider

The CLARiiON VSS Provider allows an application to access snapshot functionality on CLARiiON storage systems by using the VSS framework and other APIs introduced in Microsoft Windows Server 2003 APIs.

The CLARiiON VSS Provider does not have a user interface and is called only by the VSS service built into Windows Server 2003. For information on using the VSS Writer or VSS Requestor, refer to the appropriate documentation that shipped with your operating system.

Navisphere Manager

EMC Navisphere Manager is a storage-system-based management utility previously available only on EMC CLARiiON CX-series storage systems. It provides advanced management features over Navisphere Express, including domain management and a secure command line interface (CLI).

Navisphere Manager is now available for use with AX-series storage systems in one of two ways:

- Existing CX-series storage-system customers may use Navisphere Manager to *monitor* AX-series storage systems while still using Navisphere Express to *manage* the storage system (make configuration changes, and so on).
- Alternatively, you can purchase the optional Navisphere Manager upgrade for the AX-series storage system. This will allow you to *manage* the AX-series storage system with Navisphere Manager and Navisphere CLI, but you will no longer be able to use the Navisphere Express software.

In both cases, Navisphere Manager functions are limited. For details, see the separate document, *AX150 Series – Upgrading a Storage System to Navisphere Manager*.

Software Installation Wizard (Navisphere Manager only)

The Software Installation Wizard (SIW) implements a user interface (UI) to the Navisphere Manager software upgrade function. It provides rules-based instruction for future storage-system software upgrades similar to Navisphere Express. For details, see the separate document, *EMC CLARiiON Software Installation Guide* (P/N 300-001-504).

Navisphere Integrator (Navisphere Manager only)

The Navisphere Integrator allows storage systems managed with Navisphere Manager to be discovered and monitored through the leading enterprise management platforms (EMP). Integrator also enables the launch of Navisphere Manager from the EMP. Integrator supports the following EMPs:

- HP OpenView management software
- Tivoli NetView management software
- CA Unicenter TNG Framework

Navisphere Integrator is installed and executed on a Windows 2000 server that also hosts the EMP. For more information on Navisphere Integrator, refer to the *EMC Navisphere Integrator Administrator's Guide* (P/N 069001144), which ships on the *EMC CLARiiON Storage-System Hardware and Software Documentation* CD.

SAN Copy/E

EMC SAN Copy™/E is an optional storage-system based software package available separately for copying data directly from a virtual disk on one storage system to destination logical units on supported remote systems without using host resources. You can use SAN Copy/E to create full or incremental copies of a source logical unit. A full copy session copies all the data on the source logical unit to the destination logical units. An incremental session copies only the data that has changed since the last copy session. This can significantly reduce the time needed to copy the data, thereby allowing the copy operation to be performed more frequently and more effectively. Unlike full copy sessions, the source logical unit for an incremental session can remain online during the copy process.

SAN Copy/E is subject to the following configuration limits:

- Data can be copied only to CX-series storage systems that are also running EMC SAN Copy.
- A maximum of 100 copy sessions can be configured.
- A maximum of two copy sessions can be active simultaneously.
- The storage system must be managed with Navisphere Manager, not Navisphere Express.

For further information, see the separate document, *EMC SAN Copy/E for Navisphere Administrator's Guide* (P/N 300-002-664).

New features and changes

The initial release introduced the following new features:

- The AX150 storage system supports SATA II disk drives and the full complement of SATA II features including support for 3.0 Gb/s data transfer rates and support for native command queuing (NCQ).
- The AX150 storage system supports N+1 power, enabling the storage system to continue running if one of its power supplies fails. Two power supplies are required for the AX150 and AX150i; a second power supply is optional in the AX150SC and AX150SCi.
- Support for dual iSCSI data ports per SP.
- Support for a Gigabit Ethernet management port.
- Enhancements to the Navisphere Server Utility and Navisphere Storage System Initialization Utility to streamline the installation process for iSCSI storage systems.
- Support for up to 10 hosts.

Environment and system requirements

This section identifies the minimum environment and system requirements necessary for the AX150SC, AX150SCi, AX150, and AX150i Integrated Management Software components.

FLARE requirements

Storage-system type	Minimum hardware requirements
AX150SC or AX150SCi	• 1 SP • 1 power supply • 1 non-volatile cache card for write caching
AX150 or AX150i	• 2 SPs • 2 power supplies • 1 uninterruptible power supply (UPS) for write caching

Navisphere Express requirements

The minimum server requirements for Navisphere Express are:

- A management station with a minimum of one 500-MHz CPU, with 256 MB of RAM. EMC recommends using a 1-GHz CPU, with 512 MB of RAM.
- Internet Explorer 5.5 or greater, Netscape 7.0 or greater, or Mozilla 1.0.1 or greater.
- A TCP/IP network connection from the management station to each storage processor (SP) in the storage system.
- Minimum screen resolution of 1024 x 768 and 256 colors with small fonts.

Viewing Navisphere Express through a browser is supported on management stations running any of the following systems:

- Windows XP server
- Windows 2000 server
- Windows Server 2003 server
- Red Hat Linux server
- SUSE Linux server
- NetWare client
- Solaris client

For a listing of the currently supported versions of these operating systems, refer to *Supported Configurations* in the "Technical descriptions" section on the AX150 support website.

Navisphere Storage System Initialization and Server Utilities requirements

The Navisphere Storage System Initialization Utility and the Navisphere Server Utility are supported on servers running any of the following operating systems:

- Windows 2000
- Windows Server 2003
- Red Hat Linux
- SUSE Linux
- NetWare
- Solaris

For a listing of the currently supported versions of these operating systems, refer to *Supported Configurations* in the "Technical descriptions" section on the AX150 support website.

The Navisphere Storage System Initialization Utility runs on a server that is on the same subnet as the storage system you want to initialize.

PowerPath requirements

For PowerPath requirements, refer to the PowerPath release notes on the AX150 support website.

Fixed problems

This section identifies issues fixed in various releases.

Hardware problems fixed in version 02.20.150.5.024

Problem	Details
AX150SC, AX150SCi, AX150, AX150i – In very infrequent cases heavy I/O to the same LBA causes the front-end ports to hang (154617).	Fixed in version: 02.20.150.5.024 Solution: Prevents overlapped I/O from reaching FLARE, which avoids causing the front-end ports to hang.
AX150, AX150i – System Fault LED does not light when the UPS serial cable is disconnected (156802).	Fixed in version: 02.20.150.5.024 Solution: Fixed the System Fault LED so that it will light when the serial cable is not connected.
AX150SC, AX150SCi – System Fault LED does not light when the wrong cache card (from another storage system) is installed in the storage system (156803).	Fixed in version: 02.20.150.5.024 Solution: Fixed the System Fault LED to light when the wrong cache card is installed.
AX150SCi, AX150i – iSCSI cluster and congestion issues caused performance problems (159238 and 159278).	Fixed in version: 02.20.150.5. 024 Solution: Fixed iSCSI cluster and congestion issue.
AX150SC, AX150SCi, AX150, AX150i – In very infrequent cases the storage system does not power up completely. The SP Fault LED flashes at 1/4 Hz (161139).	Fixed in version: 02.20.150.5. 024 Solution: For every write to I/O port 0x1024 that the BIOS performs, the BIOS will read in the data at I/O port 0x1024 first. If bits 5, 4, 3, or 2 are set, the BIOS will increment an error counter and correct the THRM_POL setting by clearing bits 5, 4, 3, 2 on the write out to IO port 0x1024.

Hardware problems fixed in version 02.20.150.5.022

Problem	Details
AX150SC, AX150SCi – Heavy host I/O to the storage system causes a cache resource problem, which causes the storage system to panic. (142940).	Fixed in version: 02.20.150.5.022 Solution: Optimized cache resource allocation to accommodate heavy I/O and prevent SP panic.
AX150SC, AX150SCi, AX150, AX150i – When Solaris clustered hosts attempt to trespass a double-faulted LUN, the storage system returns an event (reservation conflict) to the cluster that causes the storage system to panic (139699).	Fixed in vesion: 02.20.150.5.022 Solution: FLARE now returns the proper error to the host when the condition described occurs.
AX150SC, AX150SCi – Enclosure LED does not light when the cache card batteries fail to charge. (150862)	Fixed in version: 02.20.150.5.022 Solution: The enclosure LED now lights when the cache card batteries fail to charge.

Problem	Details
AX150SC, AX150SCi, AX150, AX150i – The storage system or SP panics due to an unexpected interrupt related to a hardware error (146751).	Fixed in version: 02.20.150.5.022 Solution: Modified storage system software by removing SMI handler access to the APIC spurious interrupt register and APIC task priority register. SMI handler now clears low level SMI status.
AX150SC, AX150SCi, AX150, AX150i – The storage system will not boot. SP boot LED flashes at either 1/4 or 4 Hz during the boot process (161139).	Fixed in version: 02.20.150.5. 022 Solution: Modified the storage-system software to solve 1/4 hertz issue by reconfiguring the unused function of GPIO to eliminate the possibility of unexpected behavior. Fixed the 4 Hz issue by booting from the back-end boot entry if the extended post signature is found.

Hardware problems fixed in version 02.20.150.5.019

Description	Details
AX150i, AX150SCi – Fixes for NACA functionality for AIX iSCSI attaches (134317).	When SCSI commands with ACA=1, NACA=1 are sent to a LUN in ACA condition from a faulting initiator, they result in status ACA_ACTIVE instead of GOOD.
AX150i, AX150SCi - Fixes for iSCSI protocol problems (137786,141594, 141595)	High rate of certain front-end traffic, such as IP broadcast frames, could cause an SP to panic and reboot.
AX150, AX150i, AX150SC, AX150SCi – Fixes for manufacturing issues.	POST was not properly setting quiet mode on SATA drives.
AX150, AX150i, AX150SC, AX150SCi – Fixes for verifies.	Internally to the storage-system software, background verifies are performed differently.

Navisphere Express problems fixed in version 02.20.150.5.023

Problem	Details
Access violations within Navisphere Express will cause the storage processor to panic. Frequency: Rarely under a rare set of circumstances. [160065]	Navisphere Express experienced an access violation while holding a PSM file open. This caused a timer to expire and panic the SP. Navisphere Express now avoids the access violation and also opens PSM files differently so that it will not get stuck while having a PSM file open.
Navisphere Express was hitting an access violation inside of the main processing thread. It was then continuing through the main process loop with out waiting for the next iteration. This was causing Navisphere Express to take up most of the CPU cycles on the storage processor. Frequency: Rarely under an rare set of circumstances. [162392]	Navisphere Express now handles the access violation better and will wait for the timer to expire before continuing through the next iteration of the main process loop.

Problem	Details
Diagnostic files could not be instantiated, listed, or retrieved on the peer storage processor. Frequency: Always [160503, 161475]	Navisphere Express was not correctly sending along the security credentials to the peer storage processor which was then rejecting the request. Navisphere Express now correctly sends along the credentials so that diagnostic files can be instantiated, listed, and retrieved on the peer storage processor.
Navisphere Express restricts IQN names to 47 characters. Frequency: Always [163053]	Navisphere Express has changed the max size of the field to adequately handle fully qualified IQN names.

Navisphere Express problems fixed in version 02.20.150.5.022

Problem	Details
Enabling or disabling CHAP on iSCSI AX150 storage systems will cause the iSCSI ports to no longer be configured. Frequency: Always under a specific set of circumstances. [137454]	In certain conditions, Navisphere Express was using invalid port speeds. Now, in those conditions, no port speed is used to allow the default setting to be used.
When a language pack is installed on the storage system, creating a virtual disk does not work as intended. The storage system uses all remaining space in the disk pool and creates one LUN. Frequency: Always under a specific set of circumstances. [155446]	Navisphere Express was comparing the localized unit string specified by the user against the specific English string options of GB and MB to determine what the user had selected. In most cases a match was not made, which caused Navisphere Express to default to binding all of the available space. Navisphere Express now compares the localized selection the user makes against the localized versions of GB and MB.
SNMP traps sent from Navisphere Express may contain the wrong IP address in the trap details. Frequency: Frequently under a specific set of circumstances. [142405]	Navisphere Express was using an older version of a third-party DLL that did not allow this information to be set. The third-party DLL has now been upgraded and this allows Navisphere Express to correctly set the IP address within the trap before sending it.
SNMP traps contain the wrong value for system uptime. Frequency: Always under a specific set of circumstances. [145601]	Navisphere Express was using an older version of a third-party DLL that did not calculate this value correctly. The third-party DLL has now been upgraded and this value is correctly displayed in the SNMP traps.
Emails sent from Navisphere Express while using the Japanese language pack do not have the subject line correctly translated. Frequency: Always under a specific set of circumstances. [154706]	Navisphere Express now correctly uses utf-8 format to correctly translate the subject.

Problem	Details
Navisphere Express would not save the user's selection to not send email events in the selected language. After a reboot, the option would be selected again. Frequency: Always under a specific set of circumstances. [156172]	Navisphere Express now saves the user's selection so that it persists through a reboot of the SP.

Navisphere Express problems fixed in version 02.20.150.5.019

Problem	Details
An invalid check occurs on the Virtual Disk page that causes the page to display `Unknown error has occurred while displaying this page`." Frequency: Infrequently under a specific set of circumstances [138004, 144979]	Navisphere Express now checks to see if the data returned from the server is valid before attempting to perform operations on it.
Memory leaks may cause Navisphere Express to hit its memory threshold and restart. Frequency: Always under a specific set of circumstances. [140196, 141412]	The memory leaks have been fixed.

Navisphere Server Utility problems fixed in version 6.20.2.0.0

Problem	Details
The Japanese version of the Windows Server Utility will fail for any snapshot operation. Frequency: Always under a specific set of circumstances. [154651]	The default naming scheme allowed a localized string so comparison was not being done correctly. Navisphere Express no longer allows the default names to be localized so that all string comparisons now correctly find a match and the snapshot operations now succeed.

Known problems and limitations

This section identifies outstanding issues with this release, and important warnings associated with the connectivity and compatibility of this product. It also provides useful recommendations.

Known problems frequency

The frequencies for the known problems listed in this section have the following meanings:

Frequency	Definition
Every Time	Occurs whenever the specific condition is met.
Very Frequent	Occurs between 30 and 50 percent of the time when the specific cause is repeated.
Frequent	Occurs between 10 and 30 percent of the time when the specific cause is repeated.
Intermittent	Occurs between 1 and 10 percent of the time when the specific cause is repeated.
Very Intermittent	Occurs less than 1 percent of the time when the specific cause is repeated.
Extremely Intermittent	Failure mechanism may never be seen except under the most stressful QA test environments.

Hardware problems

Description	Details
AX150 and AX150i – If disk module 3 is not a component of a virtual disk, removing disk module 3 does not cause the storage-system fault light to be lit. Disk module 3 is one of the minimally specified set of disk modules for the AX150. Removing it removes a redundant copy of the FLARE Operating Environment (OE) software for SP B.	Frequency: **Every time** disk module 3 is removed if no virtual disks have a component on disk module 3. Prevention/resolution: To prevent the issue, do not remove disk module 3. To resolve the issue, reinsert disk module 3.
AX150 and AX150i – After reboot, although you can ping one or both SPs, neither SP is accessible for I/O. The SP boot/fault light on the SP is blinking. This may also be seen during a reboot due to a software upgrade of the FLARE OE.	Frequency: **Very intermittent** Prevention/resolution: Shut down and restart the storage system. If this does not work, then see the AX150 hardware troubleshooting trees on the AX150 support website for the SP boot/ fault light.

Description	Details

AX150, AX150i, AX150SC, AX150SCi -- During an upgrade operation a message similar to the following appears in the event log:
 	
`Checking file system on C:`
`The type of the file system is NTFS.`
`Volume label is FLARE Partition.`
 	
`A disk check has been scheduled.`
`Windows will now check the disk.`
`Cleaning up minor inconsistencies on the drive.`
`…`
`Windows has finished checking your disk.`
`Please wait while your computer restarts.`
This is due to an intentionally scheduled run of a utility to verify that all files were transferred and installed on the storage system correctly. (83371)
	Frequency: **Every Time**
	Prevention/resolution: The message is expected and should be ignored.

AX150, AX150SC, AX150i, AX150SCi – After reboot, an SP is not available. Fault LED in the back is blinking once every 4 seconds.(137693) or 4 times a second (140661).	Frequency: **Extremely Intermittent** Prevention /resolution: Power cycle the storage system.
AX150, AX150i – Failover on a double-faulted virtual disk results in reservation conflict. (139699)	Frequency: **Every time.** Prevention /resolution: Fix the double-faulted virtual disk before attempting failover.
AX150SC, AX150SCi - Storage system becomes unresponsive (140698)	Frequency: **Extremely Intermittent** Prevention /resolution: Power-cycle the storage system.

Software problems

This section lists known software problems.

Navisphere Storage System Initialization Utility problems

Description	Detail
Chinese version of Windows 2003 – It is not possible to enter IP addresses for the iSCSI data ports due to an issue with the handling of double-byte characters.	Frequency: **Every Time** Prevention/resolution: Use Navisphere Express to configure the iSCSI data ports.
Korean version of Windows – The Windows **Start -> Programs** menu does not get updated to include an entry for the storage system initialization utility.	Frequency: **Every Time** Prevention/resolution: Run the storage system initialization utility from its installation directory.

Description	Detail
Japanese version of Windows – Selecting the **Help** option results in two extraneous dialog boxes opening that indicate that the NavisphereArrayInitTool.htm file needs to be moved or copied.	Frequency: **Every Time** Prevention/resolution: Press the **Cancel** button on each of these two dialog boxes and then the help text will open successfully.
NetWare – Entering a blank or invalid IP address will cause the tool to appear hung.	Frequency: **Every Time** Prevention/resolution: Press **Enter** a second time and enter a valid IP address.
Storage-system discovery –The NetWare version of the storage system initialization utility will not discover uninitialized storage systems unless the management station has been configured to receive global broadcasts.	Frequency: **Every Time** Prevention/resolution: From a console window on the management station, perform the following steps: 1. Type **set allow non local broadcasts** . 2. Record the current setting. If it is equal to 1, you already have reception of broadcasts from other subnets enabled and do not need to make any changes. 3. If the value from step 2 is any value other than 1, type **set allow non local broadcasts = 1** 4. Run the storage system initialization utility from a server that has only one active network card or use the Windows version of this utility. 5. If you do not want to leave your management station configured to receive global broadcasts, type **set allow non local broadcasts =** *value_from_step_3*
Storage-system discovery – The NetWare version of the storage system initialization utility will not discover uninitialized storage systems if the management station has more than one active network card.	Frequency: **Every Time** Prevention/resolution: Run the utility from a server that has only one active network card.

Navisphere Server Utility problems

Description	Detail
64 bit Windows 2003 – The **Configure iSCSI Connections on this server** selection cannot be used on servers running the 64-bit version of Windows 2003.	Frequency: **Every Time** Prevention/resolution: Use the 64-bit version of the Microsoft Initiator software to configure the iSCSI connections.
Registration Service –The Windows 2003 version of the server utility does not automatically register new connections with the storage system.	Frequency: **Every Time** Prevention/resolution: When a new connection is created, perform a manual registration using the server utility UI. The registration service can be used to automatically update the storage system for subsequent changes to this connection.

Description	Detail
Configuring CHAP – Enabling or disabling CHAP on an existing connection can result in the connection becoming unconfigured.	Frequency: **Intermittent** Prevention/resolution: Reconfigure the connection with the desired CHAP settings.
VMware – The server utility will display only one path to the VMware console.	Frequency: **Every Time** Prevention/resolution: This behavior is as expected.
Storage-system discovery –The NetWare version of the server utility does not properly scroll screen output when many devices are present.	Frequency: **Every Time** Prevention/resolution: Redirect the output from the utility to a file to facilitate viewing.

Navisphere Express problems

Description	Details
iSCSI - In certain situations, using Navisphere Express to enable/disable CHAP on AX150i storage systems will cause the iSCSI ports to become unconfigured. (137454)	Frequency: **Rare** (only if the port is in a "link down" state) Prevention/resolution: Verify that all of the iSCSI data ports on the storage system are connected to the network and are currently accessible. Ping may be used to verify this. If you have encountered an error that CHAP could not be enabled (`The 'Enable' of the iSCSI initiator authentication failed: Invalid port speed.`), reconfigure the data ports that have become unconfigured and then establish network connectivity for the ports prior to reattempting to enable Basic or Advanced CHAP.
Passwords – Passwords cannot contain non-English characters. There are several cases though where the software will appear to allow the user to create a password with non-English characters but this password will be rejected during a subsequent login attempt.	Frequency: **Every time** Prevention/resolution: Use only English characters when creating passwords.
Creating a virtual disk – When creating a virtual disk, the error message `Out of bounds` can be returned.	Frequency: **Very Intermittent** Prevention/resolution: This error message indicates that you have exceeded the 128 virtual disk limit. Do not create more than 128 virtual disks.
Changing IP address of storage processor B – Changing the IP address of storage processor B can result in storage processor A showing storage processor B as unmanaged.	Frequency: **Intermittent** Prevention/resolution: Reboot storage processor A.
Multiple browser windows –Managing your storage system through multiple browsers on the same or different servers can result in inconsistent views of the storage system.	Frequency: **Intermittent** Prevention/resolution: Do not manage your storage system through multiple browser windows at the same time.

Description	Details
Drive letter mappings – Navisphere Express does not correctly display drive letter mappings for all virtual disks when you assign a large number of virtual disks to a single server.	Frequency: **Every Time** (if you assign too many virtual disks to the server) Prevention/resolution: Either do not assign more than 30 virtual disks to the same server or assign all the virtual disks you want to the server, and accept the fact that there will be incorrect mapping of drive letters.
Write cache disabled – You may see this warning message after you upgrade software.	Frequency: **Intermittent** Prevention/resolution: It can take five minutes for the write cache to become enabled after upgrading your software, at which time the warning message should disappear.
Downloading diagnostic files – Downloading diagnostic files does not work correctly when Navisphere Express is launched from an Internet Explorer Revision 5.5 browser.	Frequency: **Every Time** Prevention/resolution: Upgrade your Internet Explorer browser software to a version higher than 5.5.
Software upgrade using Mozilla or Firefox web browsers – An error message may be displayed indicating that your security certificate contains the same serial number as another certificate. (124170)	Frequency: **Intermittent** Prevention/resolution: Use browser options to delete the certificate associated with the storage system and restart the software upgrade.
SAN Copy - Clicking an item in the Assigned To list in the **Manage SAN Copy** dialog causes you to be redirected to the login screen. This occurs when the link name contains the # character.	Frequency: **Every Time** (if the # character exists in the name) Prevention/resolution: Do not use the **#** character when naming storage systems that will be used in SAN Copy configurations.

Navisphere FA MIB problems

Description	Detail
System URL – Storage systems that are being managed with Navisphere Express do not return the correct URL for the system URL OID of the FA MIB. A null string is returned.	Frequency: **Every Time** Prevention/resolution: Type the URL for the storage system into your browser software manually.

Snapshot problems

Problem description	Details
Navisphere Server Utility – Managing snapshots that have the same name can result in unexpected behavior in the Navisphere Server Utility.	Frequency: **Every time** Prevention/resolution: Provide unique names for snapshots that will be managed from a shared server.
Navisphere Express - Preparing multiple snapshots simultaneously can result in an erroneous error message indicating that you are out of disk space.	Frequency: **Intermittent** Prevention/resolution: Wait until one snapshot has transitioned to the Ready state before preparing the next snapshot.

Problem description	Details
Navisphere Server Utility - Providing access to a snapshot on the secondary server can take up to 30 seconds. This issue has been seen only on Windows Server 2003 servers running PowerPath MPIO attached to an iSCSI AX-series storage system. (124230)	Frequency: **Every Time** Prevention/resolution: None.
Navisphere Server Utility - Snapshot operations performed by the Navisphere Server Utility will fail if the virtual disk name contains non-English characters.	Frequency: **Every time** Prevention/resolution: Use English characters when naming virtual disks if you will be using the snapshot feature.
Navisphere Server Utility - Unable to start a snapshot from the Navisphere Server Utility.	Frequency: **Infrequent** Prevention/resolution: Run the Navisphere Server Utility from its installation folder/directory.
Navisphere Express - When you try to create a snapshot, the following error is displayed: `Unable to create snapshot resources. Please create an additional disk pool and try again.`	Frequency: **Infrequent** Prevention/resolution: Wait one minute and try to create the snapshot again.

Admsnap problems

Problem description	Details
Admsnap – Linux Admsnap on a Red Hat Linux system cannot access more than seven devices on the secondary (backup) server.	Frequency: **Frequently** Prevention/resolution: By default the Linux kernel creates only eight **sg** devices. (The internal disk uses one of the **sg** devices.) If you want the server to access more than seven devices, you must create additional **sg** devices and link them to the **sd** devices.

Localization problems

Problem description	Details
Navisphere Server Utility – The following text string was not correctly internationalized. It will always appear in English. `No devices were found that could activate this session.`	Frequency: **Every time** Prevention/resolution: Please refer to the localized release notice to obtain the translated version of this string.
Navisphere Storage System Initialization Utility – The following text string in the iSCSI data port settings dialog was not correctly internationalized. It will always appear in English. `Direct Connect`	Frequency: **Every time** Prevention/resolution: Please refer to the localized release notice to obtain the translated version of this string.

Problem description	Details
Navisphere Express – The following text string was not correctly internationalized. It will always appear in English. `The specified user already exists.`	Frequency: **Every time** Prevention/resolution: Please refer to the localized release notice to obtain the translated version of this string.
Navisphere Express – The following text string was not correctly internationalized. It will always appear in English. `Operation failed: The software package specified is already installed.`	Frequency: **Every time** Prevention/resolution: Please refer to the localized release notice to obtain the translated version of this string.
Navisphere Manager – The following text string was not correctly internationalized. It will always appear in English. `Initiator settings for a single host MUST BE CONSISTENT for all paths. Please run the Failover Setup Wizard for this host to make these settings the same.`	Frequency: **Every time** Prevention/resolution: Please refer to the localized release notice to obtain the translated version of this string.

PowerPath problems

PowerPath problems are described in the PowerPath release notes on the AX150 support website.

Limitations

This section lists issues that may affect the configuration or repair of the storage system.

Snapshot configuration limitations

Snapshots	Maximum number
Per storage system	8
Per source virtual disk	1

PowerPath limitations

Any PowerPath limitations are described in the PowerPath release notes on the AX150 support website.

Technical notes

This section contains information that will help with the installation, use, and management of the storage system. It provides generic information that applies to all platforms as well as platform-specific information.

AX150SC, AX150SCi, AX150, and AX150i notes

SP startup

For dual-SP storage systems (AX150 or AX150i), EMC recommends that you reboot an SP only during periods of low I/O activity. If the server does not have at least one path to each SP, we recommend stopping server I/O. For a single-SP storage system (AX150SC or AX150SCi), stop all I/O to the storage system.

Returning a storage system to an uninitialized state

To return an AX150 storage system to the uninitialized state (no management passwords, able to change management IP addresses) go to the AX150 support website and choose **Get Service & Support > Frequently Asked Questions**.

Event log entries appear out of order

FLARE OE software may not always enter items into the event log in the order in which they occurred. This happens only when several events occur at approximately the same time. The time stamps are correct.

Hot spare ownership

Once a hot spare is assigned to a degraded virtual disk, that virtual disk owns it until either the virtual disk is repaired and the equalize operation completes, or the virtual disk is destroyed. If the virtual disk is accidentally double-faulted because you removed the wrong disk module during repair, then re-inserting the incorrectly removed disk module should cause the virtual disk to return to its original state (including continued operation with the hot spare engaged).

Disk module insertion and removal

When inserting or removing more than one disk module from a storage system, you must pause between each removal or insertion to allow the storage system to recover. Before inserting or removing the next disk module you should make sure that:

- A newly inserted disk module's amber light is off and its blue light has returned to a normal state: on or blinking due to I/O in progress.

- On a disk module removal, the blue lights for the other disk modules return to a normal state: on or blinking due to I/O in progress.
- The storage system appears to have resumed normal operation.

Database disk module replacement

You should replace disk module 0, 1 or 2 only when the storage system is fully operational. The disk modules in these slots are FLARE OE database disk modules. Each database disk module contains an image of the storage-system configuration and current operating status. FLARE OE software ensures that the newly inserted disk module has the correct database information copied to it when it is installed while the storage system is running. If you insert a disk module into one of these slots when the storage system is powered off, the correct FLARE OE database information is *not* written to the replaced database disk module. As a result, storage-system configuration problems may occur when the storage system is powered up or if another database disk module fails. If you install a FLARE OE database disk module and you find that existing virtual disks are not enabled, contact your service provider.

Software image disk module replacement

The FLARE software image is stored on disk modules 0 and 2 for the AX150SC and AX150SCi and disk modules 0, 1, 2 and 3 for the AX150 and AX150i. Disk modules 0 and 2 mirror the software for the AX150SC and AX150SCi SP and for the AX150 and AX150i SP A. Disk modules 1 and 3 mirror the software for the AX150 and AX150i SP B. You should never remove and/or replace both disk modules in one of the mirrors at the same time. If you do, no software exists to support that SP, and the SP becomes nonfunctional.

Navisphere Integrator management of non-AX150 CLARiiON storage systems on the same subnet as AX150-series storage systems

If you install an AX150-series storage system on the same network as other CLARiiON storage systems that you manage with Navisphere Integrator, you must upgrade to Navisphere Integrator version 6.16 or higher.

Linux server notes

Admsnap

Admsnap does not support Linux 2.2 kernels.

Snapshot management

The reboot of the Linux server may be slow if deactivated snapshots exist. Activating the snapshots allows the reboot to complete normally.

VMware ESX Server configuration and usage notes

Also see the notes in the "Installation" section.

General limitations

The following configuration limitations and caveats apply regardless of whether Navisphere Express or Navisphere Manager is used to manage an AX150-series storage system.

- Use of the Navisphere Server Utility **View/Update Server to SP connections** option under a guest OS running in a virtual machine will cause incorrect server information to be displayed in Navisphere. Use this option only under the ESX Server Service Console. Access to user data will not be affected.
- SnapView™ source virtual disks provided by the AX150-series storage system must be configured on an ESX Server system as raw device mappings (RDMs). Snapshots cannot be assigned to the ESX Server system, but must instead be presented to a server running an operating system of another type. Virtual devices that are not used for SnapView snapshot operations may reside on VMFS Volumes.
- VSS is not supported.

Navisphere Express limitations

The following configuration limitations and caveats apply when an AX150-series storage system is *managed* using Navisphere Express.

- Snapshots cannot be assigned to ESX Server. This is not a restriction for Navisphere Manager.
- When using RDMs, the source virtual disk can be assigned to only one ESX Server. This is not an issue for Navisphere Manager.

Navisphere Manager limitations

When an AX150-series storage system is *managed* using Navisphere Manager, a snapshot disk and the underlying source virtual disk may both be assigned to the same ESX Server system as long as they are not both visible to the same guest OS running on the same ESX Server.

Documentation

The AX150 support website where you accessed these release notes also contains the most up-to-date documents and troubleshooting trees for this product release.

The *AX150-Series Documentation* CD (P/N 053-001-518) that shipped with the storage system also contains documents and troubleshooting trees for this product release; however, they are superceded by those on the AX150 support website.

> The troubleshooting trees on the AX150 support website are updated frequently.

Documentation updates

This section contains updates to AX150-series documentation.

Update to *AX150-Series Documentation* CD (P/N 053-001-518)

If you are viewing the documentation CD on a Solaris server, the pdf files may not open directly from the **index.htm** page. You can either save the pdf when prompted or you can view the pdfs from the **AX150 support pdf** folder.

Update to the Fibre Channel storage-system installation guides and the HBA addition or replacement guides

In the "Verifying HBA registration" section, the first sentence in the second bullet in step 2 should be:

If the status is Inactive, either the physical connection between the HBA and the storage system is faulty or the server is not powered up.

Update to the iSCSI storage-system installation guides and the NIC or iSCSI HBA addition or replacement guides

In the "Verifying NIC or iSCSI HBA registration" section, the first sentence in the second bullet in step 2 should be:

If the status is Inactive, either the physical connection between the NIC or iSCSI HBA and the storage system is faulty or the server is not powered up.

Update to *AX150-Series - Installing an iSCSI Storage System with a Network Connection to a Windows Server* and *AX150-Series - Installing an iSCSI Storage System with a Direct Connection to a Windows Server*

Dynamic disks

Contrary to what the installation guides say, do not upgrade a disk in an iSCSI storage system to a dynamic disk when writing a digital signature to the disk. Dynamic disks are not supported by the Microsoft iSCSI Software Initiator.

NIC initiators

Contrary to what the installation guides say, when configuring your NIC initiators to connect to the iSCSI storage system target, you cannot enable header or data digests when you create an iSCSI login session or discovery session.

A known defect in Microsoft iSCSI Initiator Revisions 1.05 and 1.06 causes the Initiator not to re-establish the connection between a server and a storage system when certain iSCSI digest errors occur. This behavior can cause the server to lose access to the storage system. Because of this, EMC does not support the use of iSCSI header or data digests for servers using Microsoft Initiator revisions 1.05 or 1.06 to target CLARiiON iSCSI storage systems. This defect will be corrected in a future version of the Microsoft Initiator.

iSCSI digests are primarily used to protect against data corruption from misbehaving network devices in layer 3 networks. Users are advised to use caution when running iSCSI I/O over a problematic layer 3 network without the protection of iSCSI digests. If a CLARiiON iSCSI storage system is deployed in such an environment, it should be configured to support digests, for example, a corrected version of the Microsoft Initiator.

Update to *EMC CLARiiON Server Support Products for Windows Installation Guide*

Contrary to the note on page 1-6 under the **CLARiiON VSS Provider** heading, the CLARiiON VSS Provider is supported on CX-series and AX-series with Navisphere Manager or Navisphere Express.

Update to *Navisphere Express Online Help*

In the pop-up description for **Secondary server**, the note should also state that the secondary server cannot be a virtual machine on a VMware server.

Update to PowerPath release notes

- All AX150-series installation, planning, and troubleshooting documents and software are located on the AX150 support website. For information on accessing the site, refer to the support documentation that shipped with your storage system. Refer only to these documents for prescribed installation and troubleshooting tips when using your AX150-series storage system. For an overview of the AX150 with PowerPath, be sure to read *PowerPath in Action: Maintaining Access to Virtual Disks in the AX150* (click **PowerPath** in the "Technical descriptions" section of the AX150 support website).
- A logical device or LUN on other EMC storage systems is known as a virtual disk in an AX150-series storage system.
- When there are references to accessing Powerlink, ESM, and E-Lab™ Navigator, click **Supported Configurations** in the "Technical descriptions" section of the AX150 support website
- Issue Tracker is not supported.

Software media, organization, and files

The following table lists the software and documentation media for this product release.

Part Number	CD-ROM
053-001-273	*AX-Series Server Support* CD
053-001-458	*EMC PowerPath Version 4.3.2 w4.4 for Linux* CD (Fibre Channel only)
053-001-460	*EMC PowerPath Version 3.0.5 for Novell NetWare* CD (Fibre Channel only)
053-001-340	*EMC PowerPath Version 4.4.1 for Windows* CD (Fibre Channel and iSCSI)
053-001-396	*EMC PowerPath Win iSCSI 1.1 for Windows* CD (Additional iSCSI software)
053-001-383	*EMC PowerPath Version 4.4 for Solaris* CD (Fibre Channel only)
053-001-518	*EMC CLARiiON AX150-Series Documentation* CD

Installation

The storage-system component (FLARE Operating Environment) of the Integrated Management Software is installed on the storage system at the factory prior to shipment. To install a new version of this software on the storage system, refer to the procedure for upgrading storage-system software on the AX150 support website. For information on accessing this site, refer to the support information that shipped with the storage system. Once on the website, click **Storage-system software** under "Software" in the "Upgrade" section.

You must install the server components of the Integrated Management Software. For information on installing these components, refer to the table below:

Software to install	Software media	Installation instructions
Navisphere Storage System Initialization Utility	*AX-Series Server Support* CD (P/N 053-001-273)	*Getting Started – AX150/AX150SC* (P/N 300-002-952) or Installation instructions for your configuration type in the "Install" section of the AX150 support website or the *EMC CLARiiON AX150-Series Documentation* CD (P/N 053-001-518)
Navisphere Server Utility		
PowerPath	*EMC PowerPath Version 4.3.2 for Linux* CD (P/N 053-001-258) *EMC PowerPath Version 3.0.5 for Novell NetWare* CD (P/N 053-001-460) *EMC PowerPath Version 4.4.1 for Windows* CD (P/N 053-001-340) *EMC PowerPath Win iSCSI 1.1 for Windows* CD (P/N 053-001-396) *EMC PowerPath Version 4.4 for Solaris* CD (P/N 053-001-383)	Installation instructions for your configuration type in the "Install" section of the AX150 support website or the *EMC CLARiiON AX150-Series Documentation* CD (P/N 053-001-518)

VMware ESX Server installation notes

How you install an AX150-series storage system in a configuration with VMware ESX Server software depends on whether you have upgraded from managing the storage system with Navisphere Express to managing with Navisphere Manager.

For a storage system managed with Navisphere Express

Follow the instructions in VMware ESX Server chapter in the *EMC Installation Roadmap for CX3-Series, CX-Series, AX-Series, or FC-Series Storage Systems* with the following exceptions:

- Install the Navisphere Initialization Utility and Navisphere Server Utility from the *AX-Series Server Support Products* CD that shipped with the storage system. Follow the instructions for Linux in the *Getting Started - AX150/AX150SC* guide to install and run these utilities on the ESX Server Console OS (COS).
- Skip the step on installing admhost because SAN Copy/E is not supported for Navisphere Express.
- Do *not* upgrade the storage system to Navisphere Manager.
- Skip the step on installing software enablers because they are not needed for Navisphere Express.
- Use Navisphere Express instead of Navisphere Manager to configure the storage system as follows:
  - Create a hot spare.
  - Create one or more disk pools.
  - Create one or more virtual disks on the disk pools.
  - Assign one or more disks to the ESX Server.
- Use Navisphere Express to set up Event Notification in place of setting up Event Monitor with Navisphere Manager.

For a storage system with Navisphere Manager

Follow the instructions in the VMware ESX Server chapter in the *EMC Installation Roadmap for CX3-Series, CX-Series, AX-Series, or FC-Series Storage Systems.*

VMware ESX Server guest OS installation instructions

When installing the Navisphere Server Utility on a Windows guest OS virtual machine, it is important that you answer **No** to the question `Do you want information about this server to be updated every time the server starts?` Failing to do so can result in misleading server information in Navisphere Express displays.

When installing the Navisphere Server Utility on a Linux guest OS virtual machine you will need to edit the Linux startup file to remove the following entry:

"`/opt/Navisphere/bin/naviserverutilcli update`"

Troubleshooting and getting help

To troubleshoot problems with your AX150SC, AX150SCi, AX150, and AX150i storage system, use the troubleshooting trees in the "Troubleshoot" section on the AX150 support website or the *AX150-Series Documentation* CD. You must use the troubleshooting trees before your service provider will send you a replacement part. To launch the troubleshooting trees, click **Interactive help tool** in the "Troubleshoot" section. The AX150 support website also includes a list of authorized service providers.

> The information on the website may be more up-to-date than the information on the documentation CD. For information on how to access the AX150 support website, refer to the support information that shipped with the storage system.

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